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Published in:
European Psychiatry

DOI:
[10.1016/j.eurpsy.2011.05.001](https://doi.org/10.1016/j.eurpsy.2011.05.001)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2012

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Boonstra, N., Sterk, B., Wunderink, L., Sytema, S., De Haan, L., & Wiersma, D. (2012). Association of treatment delay, migration and urbanicity in psychosis. *European Psychiatry*, 27(7), 500-505.
<https://doi.org/10.1016/j.eurpsy.2011.05.001>

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Original article

Association of treatment delay, migration and urbanicity in psychosis

N. Boonstra ^{a,*,b,d,1}, B. Sterk ^{b,1}, L. Wunderink ^a, S. Sytema ^c, L. De Haan ^b, D. Wiersma ^c

^a Friesland Mental Health Care Service, Department of Education and Research, PO Box 932, 8901 Leeuwarden, The Netherlands

^b Academic Medical Center, University of Amsterdam, Department of Psychiatry, Meibergdreef 5, Room PA3-129, 1105 AZ Amsterdam, The Netherlands

^c Department of psychiatry (CC72), University Center of Psychiatry, University Medical Centre Groningen, University Groningen, PO Box 30.001, 9700 RB Groningen, The Netherlands

^d NHL University of Applied Science, Institute of Healthcare and Welfare Studies, Leeuwarden, The Netherlands

ARTICLE INFO

Article history:

Received 21 December 2010

Received in revised form 7 May 2011

Accepted 9 May 2011

Available online 25 June 2011

Keywords:

Treatment delay

DUP

Early intervention

Migration

First episode

Urbanicity

ABSTRACT

Background. – Several factors may contribute to duration of untreated psychosis (DUP): patient-delay, referral-delay and treatment-delay caused by mental health care services (MHS-delay). In order to find the most effective interventions to reduce DUP, it is important to know what factors in these pathways to care contribute to DUP.

Aim. – To examine the relationship of the constituents of treatment delay, migration status and urbanicity.

Method. – In first episode psychotic patients ($n = 182$) from rural, urban and highly urbanized areas, DUP, migration status and pathways to care were determined.

Results. – Mean DUP was 53.6 weeks (median 8.9, SD = 116.8). Patient-delay was significantly longer for patients from highly urbanized areas and for first generation immigrants. MHS-delay was longer for patients who were treated already by MHS for other diagnoses.

Conclusions. – Specific interventions are needed focusing on patients living in highly urbanized areas and first generation immigrants in order to shorten patient delay. MHS should improve early detection of psychosis in patients already in treatment for other diagnosis.

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1. Introduction

The duration of untreated psychosis (DUP) is defined as the time from manifestation of the first psychotic symptoms to initiation of appropriate treatment [10]. Over the past 10 years, evidence accumulated on the association of shorter DUP and a better outcome on several measures [10,17,19]. Several demographical factors influencing DUP have been suggested earlier. DUP is repeatedly found to be shorter when there is an acute mode of onset of the illness [8,11,28] or when the patient is employed or studying when the illness emerges [11,16]. The literature is less consistent on the issue of active family involvement in help-seeking. Morgan et al. reported a shorter DUP whereas Compton et al. showed a longer duration [8,11]. Norman et al. reported the interesting finding that patients with an ongoing contact with professional caregivers before and during the onset of psychosis had longer delays from first service contact after onset to initiation of adequate treatment [18].

Brunet et al. define DUP as the sum of three components; the delay in help-seeking by the patient, the referral delay, e.g. by the general practitioner, and thirdly delay in recognition and treatment by mental health care services [6]. The main object of

the present study is to examine the various components of treatment delay in a representative sample of first episode psychotic patients in the Netherlands. Since migration status has been shown to be associated with longer patient delay and the various pathways to care might differ between rural and more urbanized areas, this study was designed to examine the relationship between DUP, migration status and urbanicity [2,13]. Understanding where in the pathways to care the delay occurs and who run the highest risk may help finding more effective interventions to reduce DUP.

2. Materials and methods

2.1. Subjects

The study was conducted in two mental health care services in the Netherlands each with an early intervention program for psychosis; geographically covering the province of Friesland and the city of Amsterdam. The basic organisation of mental health services in Amsterdam and Friesland is similar. Both areas have implemented early detection and intervention for psychosis and for patients with an at risk mental state for psychosis. Referral by a GP is the standard route for referral to MHS, although self-referral (mostly via emergency services) is possible in both areas. Inclusion took place from May 2008 through September 2009. Inclusion criteria were a DSM-IV diagnosis of a non-affective psychotic

* Corresponding author. Tel.: +3158 284 8989; fax: +3158 284 8040.

E-mail address: nynke.boonstra@ggzfriesland.nl (N. Boonstra).

¹ These two authors contributed equally to this work and are joined first authors.

disorder, no appropriate treatment with antipsychotic medication so far and an age between 10 and 36 years. We excluded patients with a substance induced psychotic disorder or patients with a neurological or endocrine disorder possibly related to the psychosis.

The population in the catchment area amounted to 1.4 million. The province of Friesland is a mixed rural-urban area with about 645,000 inhabitants and a mean population density of 192/km² on January 1st 2009, of whom 25,000 (3.9%) were first generation immigrants and 28,000 (4.3%) second generation immigrants. The population at risk (10–36 years of age) in Friesland was 204,700 inhabitants. The city of Amsterdam is an highly urbanized area with a mean population density of 4493/km². Its number of inhabitants was 755,600 on January 1st 2009 of whom 214,000 (28.3%) were first generation and 160,000 (21.2%) were second generation immigrants. The population at risk was 299,600 inhabitants. The early intervention programs in both areas provide comprehensive treatment to patients suffering from a first episode psychosis, inpatient as well as outpatient care.

2.2. Measures

The assessment protocol included completion of a validated semi-structured interview to establish DSM-IV diagnosis shortly after intake, by means of the mini-Schedules for Clinical Assessment in Neuropsychiatry (SCAN) [15] or Comprehensive Assessment of Symptoms and History (CASH) [3]. Information regarding DUP was collected using the Dutch translation of the Nottingham Onset Schedule (NOS), with the same definitions as proposed by Singh et al. [23]. The NOS was developed to systematically determine the onset of prodromal and psychotic symptoms and the start of antipsychotic medication or intensive treatment. For all first contact patients with a psychotic disorder, the onset of the first psychotic episode, dates of first contact with primary health care, referral to MHS and initiation of appropriate antipsychotic treatment and intensive treatment were collected based on all available data sources; including a semi-structured personal interview with the patient and relatives, and information from medical files. If only a year was known, the first of July of that year was noted as a date, when only a month was known, the 15th of that month was noted. In addition to this, data on date of birth, age at onset of psychosis, postal code, and nativity were collected. The definition of the different components of DUP – patient delay, referral delay and delay within MHS – are specified in Table 1. To determine nativity, we used the classification of the Netherlands' Bureau of Statistics (<https://statline.cbs.nl>). If a patient or one of his or her parents was born in another country, then the patient was

assigned to the nativity group that fitted that foreign country. In case of parents born in different countries, the country of birth of the mother was used. When a patient and at least one of his or her parents were born in another country, then the patient was classified as a first generation immigrant. If a patient was born in the Netherlands but at least one of his or her parents was born in another country, the patient was classified as a second-generation immigrant. This definition of nativity implies that the “native-born” group includes third generation immigrants (i.e. those with parents born in The Netherlands but grandparents not). With respect to urbanicity, we divided our study population in three subgroups. Patients were assigned to highly urban area when they lived in the city of Amsterdam (> 750,000 inhabitants), patients where assigned to an urban area when they lived in a town (about 100,000 inhabitants) and the third group consisted of patients living in a rural area.

2.3. Statistical analysis

All analysis were performed by the use of SPSS 17.0. Mean and median DUP was calculated for all components of DUP and for the overall DUP. Because of the skewed distribution of DUP, we used non-parametric statistical analysis if DUP was one of the variables tested. Mann Whitney U tests were used to assess whether distributions of DUP were equal for two different groups and Kruskal Wallis tests were used to test for equality of median DUP of more than two groups. We used a generalized linear model (GLM), acknowledging the Gamma distribution of DUP, to assess confounding.

3. Results

A total number of 182 patients was included in the study. A summary of patients' characteristics is presented in Table 2. The mean age at onset for males was 21.8 years \pm 4.9 (SD) and for females 22.5 years \pm 5.8 (SD), difference in age at onset was not significant.

3.1. Duration of untreated psychosis

Mean total DUP for all patients ($n = 182$) was 53.6 weeks \pm 116.8 116.8 (SD). The median DUP was 8.9 weeks, (Q1 = 2.0 and Q3 = 47.8, range 0–874). Fig. 1 gives an overview of the distribution.

Mean patient delay was 32.4 weeks \pm 100.4 (SD) with a median of 0.5 weeks and a range from 0 day to 16 years (Q1 = 0.0 and Q3 = 12.7 weeks). Patient delay for 19 patients was zero because they had already been in mental health care treatment for another

Table 1
Definitions.

Duration of untreated psychosis	The time (weeks) between the first experience of psychotic symptoms for more than 1 week and the initiation of appropriate treatment
Patient delay	The time (weeks) between the first experience of psychotic symptoms for more than 1 week and first contact with a professional health care worker, e.g. a GP
Referral delay	The time (weeks) between first contact with a professional health care worker and referral to mental health care services
Delay within mental health care services	The time (weeks) between referral to MHS and initiation of appropriate treatment
Psychotic symptoms	A PANSS score of 4 or more on at least one of the items 1 (delusions), 3 (hallucinatory behaviour), 5 (grandiosity), 6 (suspiciousness/persecution) or 9 (unusual thought content)
Appropriate treatment	The use of antipsychotic medication for at least 1 month and/or the start of intensive treatment. If so, the first day of receiving medication or the first day of start of intensive treatment was noted as start of appropriate treatment. Whatever was first
Intensive treatment	Frequent contacts with patient and their family, psychoeducation and rehabilitation. The first day of this intensive treatment was noted as start of intensive treatment

Table 2
Sample characteristics (*n* = 182).

	<i>n</i> ^a
Mean age at onset of first episode psychosis	21.9 years (SD ± 5.1)
Gender	
Male	140 (76.9%)
Female	42 (23.1%)
Diagnosis	
Schizophrenia	89 (48.9%)
Psychotic disorder Nottingham onset schedule	57 (31.3%)
Brief psychotic disorder	5 (2.7%)
Schizoaffective disorder	15 (8.2%)
Schizophreniform disorder	16 (8.8%)
Residential area (urbanicity)	
Extremely urban (city)	99 (54.4%)
Urban (town)	38 (20.9%)
Rural	45 (24.7%)
Nativity	
Dutch	102 (56.0%)
First generation immigrants	49 (27.0%)
Second generation immigrants	31 (17.0%)

^a Numbers unless otherwise specified.

diagnosis at onset of first episode psychosis. The mean referral delay was 5.6 weeks ± 23.9 weeks (SD) with a median of 0.0 weeks (range: 0–23; Q1 = 0.0 and Q3 = 1.9 weeks). The mean delay in mental health care services (MHS) was 15.6 weeks ± 42.6 (SD) with a median of 0.9 weeks (range: 0–300; Q1 = 0.0 and Q3 = 6.7 weeks).

The majority of patients (53.3%, *n* = 97) were referred to MHS by a general practitioner (GP). Fifty-four patients (29.7%) came into contact with MHS via emergency services, four patients (2.2%) were referred by other medical professionals like a general hospital or youth health service, eight patients (4.4%) were referred by non medical professionals like religious institutions or relatives and 19 patients (10.4%) had already been under treatment by a mental health care service for another diagnosis when the first psychotic symptoms emerged.

The mean referral delay due to GP's was 10.2 weeks (±32.1) with a median of 0.6 weeks while this was 0.3 weeks (±1.3) with a median of zero weeks for emergency services, and 0.8 weeks (±1.1) for other medical professionals. Patients who came in contact with MHS via their GP had significantly longer referral delay than patients who were referred by emergency services or other medical professionals (Kruskal-Wallis $\chi^2 = 30.7$, *df* = 2, *P* < 0.001).

The 19 patients who had already been under treatment in mental health care services at the time of onset of psychotic symptoms, had a mean MHS delay of 25.2 weeks ± 32.4 (SD) with a median of 13.1 weeks. The mean MHS delay for the other 163 patients was 14.5 weeks (±43.6), with a median of 0.3 weeks. Median MHS delay was significantly longer for patients who were already treated by mental health care services compared to all other patients (MW U: 730, *Z* = −3.9, *P* < 0.001).

There were no significant differences in pathways to care between males and females (patient delay MW U: 2679, *Z* = −0.93, *P* = 0.36; referral delay MW U: 2658, *Z* = −1.08, *P* = 0.28; MHS delay MW U: 2861, *Z* = −0.28, *P* = 0.78) and there was also no significant difference in the overall DUP between the various referrers (Kruskal-Wallis $\chi^2 = 5.7$, *df* = 4, *P* = 0.22).

Table 3 shows the means and contribution of the different components of DUP for native-borns, first and second-generation immigrants in rural, urban and highly urbanized areas. DUP was significantly longer for patients living in a highly urbanized area (Kruskal-Wallis $\chi^2 = 4.0$, *df* = 2, *P* = 0.046) and this was mainly due to a longer patient delay. Patients from rural areas had long MHS delay in contrast to patients from urban and highly urbanized areas, this difference was not significant (Kruskal-Wallis $\chi^2 = 2.9$, *df* = 2, *P* = 0.089). First generation immigrants had significantly longer overall DUP than native-born patients and second-generation immigrants (Kruskal-Wallis $\chi^2 = 6.2$, *df* = 2, *P* = 0.045). First generation immigrants from highly urbanized area had the longest patient delay with a mean of 88.1 weeks (SD 186.6) and this was 89% of overall DUP (99.4 weeks, SD 185.7) in this group. Although it seems that first generation immigrants from rural and urban areas suffer less pronounced patient delay and longer MHS delay than native-borns, differences in DUP components between migration status groups were not significant when tested with a Kruskal-Wallis test.

Since migration status and urbanicity are strongly correlated (phi coefficient: 0.411, *P* < 0.001), we conducted a GLM to assess the effects on DUP. The result of this GLM showed that only migration status, remained a significant predictor, even after controlling for age of onset and sex (*P* = 0.01).

First and second generation immigrant patients were more likely to be referred to MHS by emergency services than native-born patients ($\chi^2 = 7.30$, *df* = 1, *P* = 0.007) and second generation immigrants were referred by emergency services more often than first generation immigrants ($\chi^2 = 4.64$, *df* = 1, *P* = 0.031) (Fig. 2).

4. Discussion

Mean and median overall DUP found in this study (53.6 and 8.9 weeks respectively) is shorter than mean DUP of about 1 or 2 years and the average median DUP of 26 weeks reported in most other studies [10] but in accordance with a recent Dutch multicentre study in which a mean DUP of 1 year and a median DUP of 1 month was found [27]. An explanation for this relative short mean and median DUP might be explained by the early intervention programs implemented in the areas of the study as well as services for detection of ultra high risk subjects [20]. Specialized services for detecting ultra high risk subjects have shown to play a role in reducing DUP [14].

This study found that first generation immigrant patients have longer overall DUP than native-born and second-generation

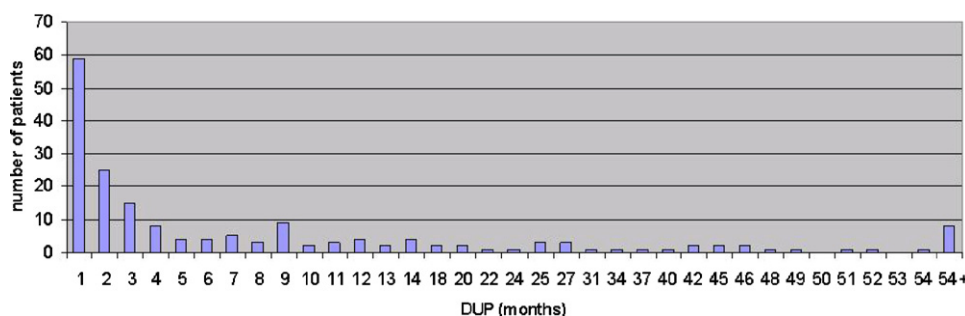


Fig. 1. Distribution of duration of untreated psychosis (*n* = 182). 54+; 60, 62, 64, 66, 81, 133, 197, 202 months (one in each of these months).

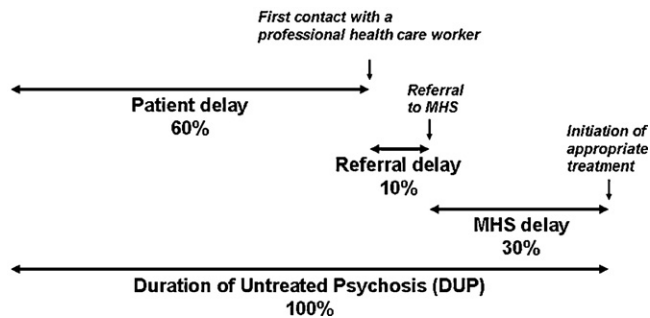


Fig. 2. Duration of untreated psychosis components. MHS: mental health care services.

immigrant patients. In addition; first and second generation immigrant patients have a greater chance to enter mental health care services by emergency services compared to native-born patients, a finding that concurs with a British study, where Morgan et al. have shown that being a member of a black minority increased the chance to reach specialized services via non-health professionals [13]. Several possible explanations for an association between longer DUP and non-native-born background have been proposed. First generation immigrants may be less acquainted with the concept of mental illness and the mental health services [26]. Also, feelings of shame and fear for stigma may be more pronounced and first generation immigrants might be more likely to seek help from religious or alternative healers first [9]. Finally, these individuals are more likely not to be fluent in Dutch and this

language barrier may also cause delay. It is plausible to suggest that these factors diminish in following generations.

DUP was longest for patients living in a highly urbanized area and this was mostly due to a longer patient delay. Living in a highly urbanized area is confounded with immigration status and this has an influence on the correlation of urbanicity and DUP as shown in the GLM analysis. Nevertheless, native-born patients living in a highly urbanized area seem to have a longer patient delay and overall DUP too.

MHS delay was significantly longer for patients from rural areas as compared to patients living in urban and highly urbanized areas. The longest MHS delay was seen in immigrants from rural and urban areas. Despite the fact that this difference did not reach statistical significance in this study, this might be an important issue in the light of the already longer overall DUP seen in immigrants. Because the incidence of psychotic disorders is higher in urban and highly urbanized areas, clinicians in these areas might be more familiar with the detection of psychotic symptoms and start appropriate treatment earlier. And this effect may be even more pronounced in immigrants living in rural and urban areas. This factor could explain at least part of the differences in treatment delay caused by mental health care services. The basic organisation of mental health services in Amsterdam and Friesland is similar. Differences in delay of referral to MHS and delay within MHS are unlikely to be caused by mental health services organisation. Systematic screening instruments for emerging psychosis improve the detection of first episode psychotic patients and thereby shorten MHS delay [5].

Since a GP is the final referring agency in most cases (53%), GP's might play an important role in the pathway to care for psychosis

Table 3

Contribution of components of duration of untreated psychosis on overall duration of untreated psychosis for native-borns, first and second generation immigrant patients living in rural, urban or highly urbanized areas ($n=182$).

	Patient delay		Referral delay		MHS delay		Overall duration of untreated psychosis
	Mean ^a (SD) (% of overall duration of untreated psychosis)	Median	Mean ^a (SD) (% of overall duration of untreated psychosis)	Median	Mean ^a (SD) (% of overall duration of untreated psychosis)	Median	Mean ^a (SD)
Rural ($n=45$)	12.9 (34.1)	0.0	5.2 (16.9)	0.0	21.2 (49.5)	2.0	39.2 (63.5)
Native-borns ($n=37$)	10.9 (28.7)	0.0	4.9 (16.8)	0.0	17.3 (41.4)	2.0	33.1 (57.5)
First generation immigrants ($n=8$)	22.0 (54.5)	0.9	6.6 (18.4)	0.0	39.0 (78.2)	5.8	67.7 (85.1)
Second generation immigrants ($n=0$)	–	–	–	–	–	–	–
Urban ($n=38$)	8.5 (20.5)	0.0	7.3 (37.4) 25%	0.0	13.8 (31.0) (47%)	0.4	29.6 (54.0)
Native-borns ($n=28$)	9.9 (23.4)	0.0	9.5 (43.6)	0.0	6.2 (13.6)	0.0	25.5 (54.3)
First generation immigrants ($n=10$)	4.6 (8.7)	0.0	1.2 (2.8)	0.0	35.1 (52.1)	4.1	40.9 (54.4)
Second generation immigrants ($n=0$)	–	–	–	–	–	–	–
Highly urban ($n=99$)	50.5 (131.1)	2.0	5.1 (20.0)	0.0	13.8 (43.2)	0.4	69.4 (147.3)
Native-borns ($n=37$)	22.3 (52.7)	2.0	8.3 (31.2)	0.0	11.3 (31.8)	0.0	41.9 (64.5)
First generation immigrants ($n=31$)	88.1 (186.6)	4.4	5.4 (10.1)	0.3	5.9 (10.7)	2.4	99.4 (185.7)
Second generation immigrants ($n=31$)	46.5 (124.7)	0.6	0.8 (2.0)	0.0	24.9 (67.7)	0.0	72.3 (172.0)
Overall	32.4 (100.4)	0.5	5.6 (23.9) 10%	0.0	15.6 (42.6)	0.9	53.6 (116.8)

^a All means and SD's are presented in weeks.

although most GP's not even see a first episode psychotic patient every year [21]. In addition, delay due to waiting lists in MHS is attributed to referral delay. There was no association between the referrer source and the overall DUP. A recent meta-analysis shows inconsistent results [2]; some studies show longer DUP for patients who were referred by a GP while other studies report a shorter DUP for patients referred by a GP. In this study, the referral delay due to a GP was significantly longer than the delay due to other referrers.

The finding that patients who developed a psychosis while in the care of mental health care services have a long delay is in accordance with earlier findings in Canada [18]. Norman et al. showed that one cannot assume that once contact with mental health care services occurs an expedited pathway to treatment of psychotic disorder will follow. Those patients seem to be at particular risk of treatment delay. This calls for systematic re-evaluation of diagnosis during treatment of any type of disorder at mental health care services [5,24].

Contact with (MHS) emergency service is the fastest route to appropriate treatment. Yet, it is not a preferred route, as these patients often have a long patient delay, possibly related to the fact that patients entering treatment through this route demonstrate a more severe symptom profile [1]. The finding that first and second generation immigrant patients have a greater chance to enter via emergency services is supported by the study of Snowden and Yamada [25] and this is also in accordance with the previously reported findings from Canada [4] where first presentation at emergency services led to faster treatment initiation. It is suggested that emergency services were utilized more often by non-native-born groups because of the language barrier to usual mental health care services. Entering early intervention services through emergency services has previously been associated with poorer engagement [7]. Although Singh et al. stated that there is no robust evidence for an association between cultural aspects and differences in pathways to care [22], the present study demonstrates a relation between immigration status and pathway to care. An earlier study by Morgan et al. did not find a relation between ethnicity and DUP [12,13]. The difference between their study and the present one is that their definition of ethnicity was based on origin and not on immigration status (first or second). Differences in DUP might, therefore, be related to the effects of immigration and not to ethnic background.

Overall, DUP in the highly urbanized area is relatively short while patient delay is still relatively long. This could be explained by the fact that all second generation immigrants live in such an area which calls for specific interventions to improve detection of psychosis among first and second generation immigrants.

4.1. Methodological considerations

DUP is a concept with several definitions and different measures, which hampers the comparability of the results of different studies. The onset of psychosis is nearly always retrospectively determined and based on information from patients. This can lead to an information bias. In this study information from family members and medical files was also used which may have improved the reliability of our data [3]. Although data was collected by different members of the research team, all cases were discussed in researchers meetings until consensus was reached which may have reduced observer bias.

Literature on the association between DUP and migration status is sparse. More research is needed on this subject. In our study, all second generation immigrants lived in a highly urbanized area, in future research, it is recommended to include

also second generation immigrants who live in urban or rural area.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

Acknowledgements

For the Early Assessment in Schizophrenia Effectiveness (EASE) study GGZ Friesland received a grant from the Province of Friesland.

Funding for the Amsterdam part of the study was provided by ZonMw (The Netherlands Organisation for Health Research and Development). Grant 63300020; ZonMw had no further role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication.

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